

2021 JPM Macro, Quantitative and Derivatives Conference

Key Takeaways, Investor Survey on Macro Outlook, Quant Investing, AI/Alt Data, Crypto

J.P. Morgan hosted its 23rd Macro Quantitative conference on January 22nd. The Conference was attended by ~3400 investors representing ~1500 institutions from across the world. The conference featured presentations from Agilon Capital; AP7; BT Pension Scheme; Capital Fund Management; Connor, Clark & Lunn Investment Management; Cubist Systematic Strategies; Dark Forest Technologies; Fulcrum Asset Management; Graham Capital Management; Man/AHL Group; Millennium Investments; and Teacher Retirement System of Texas. Speakers at the conference deliberated on various aspects of Macro and Quant Investing: **tail risk hedging, inflation tipping point, dynamics of equity-bond correlations, evolution of factor investing and systematic macro, quantitative credit strategies, scope/limits of Machine Learning, harnessing Alternative Alpha, and others.** In this report, we have summarized the conference presentations, highlighting the key insights from each talk. Our next Macro Quant Conference will take place in June of this year, with more details following soon. Please [email us](#) if you are interested in attending.

A large Investor Survey was conducted, incorporating views of conference attendees on a wide range of relevant market-related topics:

- **Macro outlook**—investors surveyed expect 10yr bond yield between 1.25%-1.75% by year-end (less than 15% expect 10yr yield above 1.75% by year-end). Interestingly, only 10% of participants see the US 10yr yield between 1.5%-2.0% posing a risk to equity market/multiple, while on the contrary 17% see risk to equities only at 10yr yield above 3%. The majority (70%) of participants expect to see equity multiple pressure once 10yr yield is around 2.5%. Nearly half (44%) of the investors expect S&P 500 year-end level between 4,000-4,500 and expect VIX to average around 20 during this year.
- **Major risks to market**—investor response was quite divided. Top two cited risks were COVID-19 mutations (29%) and correction in expensive equity segments (28%). One-fifth (21%) of the participants fear inflation/yield spike. Few fear central bank tapering (13%) and a double-dip recession (9%). **Best way to hedge inflation risk is via Commodities (42%) followed by Stocks such as Energy (32%).** Significant number of investors thought Cryptocurrency (58%) and Electric Vehicles/Green Tech (29%) were in a bubble. Interestingly only a few believe bond-proxies (3%) are in bubble territory.
- **Quantitative strategies**—largest inflows are anticipated in ESG (48%) followed by CTAs (16%). Largest outflows are expected from Risk Parity (42%) and Equity multifactor strategies (27%). However, few (11%) believe ESG will provide best opportunities for Quants. Most see opportunities in Big Data/ ML (31%), EM/China (29%) and systemic credit (24%). A majority of investors (84%) expect Value outperformance to continue – for short-term (51% vs 50% last year) and as beginning of longer term Value cycle (33% vs 18% last year).
- **Application of volatility scaling/targeting**—there seems to be an increasing adaptation with only a fifth (18%) of participants reporting no use, much lower than last year (35%). Most popular methodology for vol measure is a proprietary mix (29%) followed by weighted realized vol (24%).
- **Cryptocurrencies**—only 11% of investor firms trade in Crypto. Of those that don't, 22% plan to do so. Majority (58%) believe Crypto is here to stay. Three-in-four (77%) investors expect tighter regulations of Crypto with almost all (98%) believing

See page 34 for analyst certification and important disclosures.

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fraud is somewhat or very much prevalent in crypto world.

- **Adoption of Big Data/AI Strategies**—more than half of the responders (55%) want to use it as a tool to enhance existing quant strategies or portfolio construction/risk management, while a ~fifth do not plan to use it. The number of practitioners evaluating 1-3 alternative data sources remained similar to last year (44% vs 45%). Half of investors have found at least one ‘Alternate Data/ML based signal’ that yields alpha.

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Summary of Presentations

With the world enduring pandemic, economic and political crises, Quantitative Investing and Risk Management are facing a challenging environment. The Global Macro Quantitative and Derivatives Strategy team has helped the investors with numerous thematic thought pieces in the recent months: [Retail Participation](#), [Short Squeeze](#), [Rotation into Value](#), [Where are the bubbles and COVID-Green risk](#), [Equity Macro and Quantitative Outlook for 2021](#), [Vaccine Triggers Largest Daily Momentum Crash/Value Squeeze Ever](#), [Vaccine Rotation](#), [Subsiding Risks](#), [Market Nirvana](#), [Likely the best of both worlds for stocks](#), [Election Baskets](#), [Update on overnight developments](#), [Improving Corporate Outlook](#), [Hedging Long-Term Risks](#), [Correlation Shocks](#), [Conditions Increasingly Favor COVID-19 Recovery Candidates](#), [Potential for a Value Rally](#), [Election Implications for Equities](#), [Democrat Agenda Winners and Losers](#), [Evolving Business Models](#), [Quarter-end rebalance impact](#), [Positioning and low risk of new lockdowns justify buying the dip](#), [Market Risk Outlook](#), [Updated COVID-19 analysis: Nursing homes](#).

Continuing the effort to support clients with the most topical discussions, the conference was targeted around ongoing crisis focusing on quant macro (e.g. tail risk hedging, equity-bond correlations), risk premia strategies (e.g. cyclical influences on equity factor investing), Machine Learning, Alternative Data among many topics with the aim of helping navigate periods of heightened volatility. The conference was attended by ~3300 investors representing ~1500 institutions from across the world. The conference was moderated by Marko Kolanovic, Global Head of Macro Quantitative & Derivatives Strategy and Dubravko Lakos, Head of US Equity Strategy & Global Quantitative Research. The conference featured presentations from Agilon Capital; AP7; BT Pension Scheme; Capital Fund Management; Connor, Clark & Lunn Investment Management; Cubist Systematic Strategies; Dark Forest Technologies; Fulcrum Asset Management; Graham Capital Management; Man/AHL Group; Millennium Investments; and Teacher Retirement System of Texas. Speakers at the conference deliberated on various aspects of Quant Investing: tail risk hedging, inflation tipping point, dynamics of equity-bond correlations, evolution of factor investing and quant macro, systematic credit strategies, scope/limits of Machine Learning, harnessing Alternative Alpha, and others. In this report, we have summarized the conference presentations highlighting the key insights from each talk.

In recent years, investors have paid increased attention to Alternate Risk Premia as a source of returns uncorrelated with conventional equity and bond risk premia. Moreover, low global policy rates has inflated the valuations of these traditional assets and depressed the implied premia of several asset classes to decade low levels, adding to the attractiveness of alternate risk premia. In addition, application of Big Data, Machine Learning and Artificial Intelligence to risk premia investing remains a heavily discussed topic. At J.P. Morgan, we have published extensively on these topics, including detailed guides on [Cross-Asset Systematic Strategies](#), [Cross-Asset Momentum](#) and [Equity Risk Premia Strategies](#); a primer on [Big Data and AI Strategies: Machine Learning and Alternative Data](#); [US Factor Reference Book: Payoffs, Pitfalls and Analysis of 100+ Equity Factors](#) and recently: [COVID-19 Composite](#), [2019 Alternative Data Handbook](#), [Automated Machine Learning](#), [The Value Conundrum](#), [Revisiting Value](#), [Equity Risk Premium](#), [Cross Asset Style Timing](#), [Defensive Risk Premia](#), [The quest for pure equity factor exposure](#), [Market-neutral carry strategies](#), [Optimal option delta-hedging](#), [Timing FX short-vol strategies](#), [Skew as a trading signal for macro assets](#), [Inflation Expectation Tracking Equity Baskets](#).

Given the recent growth in Retail Participation, we are also actively researching the field supporting clients with deeper insights and thematic trading strategies – [Growing Retail Participation](#), [Follow the Robinhood Money](#), [A \(Sub\)Penny Saved](#), [Retail Trading in the US Equity Market](#).

Our team's growing focus area has been on Big Data and ML/AI Strategies – [Alternative Data and the U.S. Election : Analysis of state voter registration](#), [Political choices and financial forecast](#), [big data and early indications of US pandemic inflection](#), [Industry Developments in 1H20](#), [Structural digitalization trends](#), [Social Media Analytics for US Election](#), [Identifying themes and selecting stocks via NLP](#), [Applications of Machine Learning in Cross Asset Derivatives](#), [Systematic FX Option Portfolios](#), [Measuring the impact of COVID-19 on guidance statements](#), [Big Data in a Pandemic : Internet of living things – big data can save lives and economics](#), [Applications of Machine Learning in Equity Derivatives](#).

Conference Presentations

Keynote

The fireside chat with Sandy Rattray started with a discussion on 2020. The speaker highlighted the narrative was that Quant had a poor 2020. This was certainly true for quant equity though quant credit, fast strategies or long-vol strategies in general, futures trend-following and trend following in other macro had a good to exceptional 2020. Moving onto a discussion on Value, the speaker recapped that Value was very difficult in the US and outside: the rally in November was strong for most though the Momentum reversal and sell-off underlying the rally was overwhelming for many managers. The chat concluded with a discussion on cryptocurrencies. The speaker noted it was difficult to place a fair value on a crypto asset. One attractive aspect is that volume is up a lot so not only can you have a CTA here, you can potentially market-make. It is more of a technical market and dominated by retail. It must though be noted, the speaker said, crypto is particularly bad for the environment: i) not socially useful, ii) ESG impacts are disturbing and iii) exceptionally environmentally unfriendly.

Tail Hedging and Other Defensive Strategies: A Practitioner's Guide

The speaker elaborated practical aspects of tail risk hedging. The theoretical trade-off between reliability and cost of hedging is affected by frequency of reward. Most hedges have performed worse in the post- GFC period with short FX carry being an exception. Based on presenter's proprietary model, the real expected return on government bonds in the US is quite poor and currencies as a hedging instrument look more interesting. Even during periods of high volatility the transmission of volatility across asset classes remains inefficient. The presenter concluded by noting that hedging strategies, including long equity puts and government bonds, entail substantial basis risk and that the most reliable hedges tend to have the lowest, and usually negative, expected returns. Furthermore, until bond yields have room to fall sharply, other asset classes may provide more potent hedges and a hybrid approach of systematic and discretionary strategies is required to effectively generate convexity.

The Consequences of an Inflation Tipping Point for Bond-Equity Correlation and the Impact on Portfolios

This presentation focused on the correlation dynamics between equities and bonds, with the central theme revolving around the fact that the correlation between equities and bonds has been positive for a large part of history. The negative correlation between equities and bonds over the past 20 years is more outlier than the norm. This effect is shown to be consistent across DM markets as well in various tenors of government debt. Additionally, the correlation seems to be the same between the bulk of returns and the tails. The key implications of these dynamics are. 1) Correlation can be modelled with a regression using inflation and risk adding weight to the argument. 2) The possible flip has consequences for portfolio managers –60/40 (or risk parity) portfolios have lower risk adjusted returns 3) Future bond returns look poor (with rates at historical lows) and may hedge equities less than before. 4) Look for more sources of diversification and/or hedge (other than bonds).

The Dynamics of Equity-Bond Correlations at the Zero Lower Bound - Implications for Asset Allocation

The presenter detailed an approach to modelling the dynamics of stock and bond correlations in the context of a regime changes. The central premise revolves around the fact that the negative correlation between stocks and bonds, we have grown accustomed to over the past two decades, has, in fact, been positive for large parts of history. The differences in correlation structures can be explained by differences in the macroeconomic environments in these periods. Some of the key findings of the results of the modeling analysis are: 1) Stock and bond dynamics and their correlation are well explained by the interaction of growth, inflation, and monetary policy and the risk premia associated with these factors. 2) High and volatile inflation is bad for bonds and stocks and induces a strong positive stock-bond correlation. 3) Monetary policy by itself, independently of growth and inflation, also moves stocks and bonds in the same direction further contributing to positive correlation. 4) Growth shocks move stocks and bonds in opposite directions and induce a negative correlation. As a result of these findings the hedging properties of bonds could be severely diminished should we return to a positive correlation regime.

The Evolution of Quant Macro: From Technical Analysis to Systematic Credit

The speaker started the discussion that when evaluating a strategy the fundamental law of active management is a tool to do just that where the IR (Information ratio) is the strength of the signal divided by the number of independent bets. The key emphasis is on the independent bets / forecasts in the breadth measure of the IR. Systematic credit is the area of the bond market with profligate assets suitable to such efforts i.e. being able to place many independent bets. Systematic credit, the speaker defined, is essentially corporate bond stat arb. A \$10 trillion market with \$2 trillion issued in 2020, we can apply our equity stat-arb machinery. Now we can take thousands of bets. Though, the speaker cautioned, why doesn't everyone do it? There are a number of challenges including i) assets: bonds are more complex than equities, there are a lot more of them, and managing the securities master document is non-trivial, ii) data: is much dirtier, with vendor reliability and timeliness issues, and finally iii) trading: a fragmented market, often manual with high *t*-costs.

Quant Equity Investing - Cyclical Influences, Secular Trends and Performance Implications

In the last decade much capital and risk had been committed to Quantitative factor investing but the rewards has not matched the expectations. Any Quant strategy would work in specific environments and not work on the rest. Value is essentially a convergence strategy but had been underperforming in recent decade. The drivers may not reflect strong relationships on shorter period but would be more justifiable on longer periods. Nominal economic growth and Value dispersion are drivers of Value factor returns on longer periods. Also structural changes in the industry with commoditization of smart beta has resulted in increased inflow and outflow from these strategies. This results in misplaced expectations. Also there had been bifurcation in evolution of the factor investing approaches – (1) Improving in efficiently of participating in the smart beta factors; (2) Evolving the smart beta strategies into more differentiated alphas, with intention behaving as smart beta would do 20yrs ago. The innovative differentiated factor strategies continue to get rewards in the recent periods.

Pension Fund Panel: Quant and Risk Premia Investing

The panelists presented their views on various risk premia investing topics from the perspective of the pension fund investor. Risk premia is an attractive proposition for pension funds as it brings diversification, it scalable and can be used to fund protection as well. According to the panelists the change in the yield curve environment has had a pronounced effect and the experience in 2020 has highlighted the importance of portfolio construction with focus on tail risks and the rigorous due diligence and scrutiny. Pension funds are better positioned to sustain periods of risk premia underperformance and the panelists reiterated their conviction in the major themes that risk premia like carry, value, quality, momentum and mean reversion. Investors shall be on the lookout to be compensated for idiosyncratic risk and for stable income generation if risk premia is to be used to fund protection. Code sharing platforms, flow strategies, trading type of strategies, credit risk premia are areas with strong innovation potential and care shall be taken to introduce ML in gradual steps.

Rage Against Machine (Learning)

In this talk entitled “Rage against Machine Learning,” Jacob Kline CEO/CIO of Dark Forest technologies gives his perspective on where machine learning fits in in the systematic investment space today. He gives insight into the common pitfalls that many firms experience when they attempt to incorporate machine learning into their current system. Overall, he believes that ML is important but must be used as a tool to enhance a current alpha-generation system rather than simply be a ‘black-box.’

Is Alternative Data Alternative Alpha? What it takes to make it work

The speaker discussed the nature of alternative alpha and how no vendor is going to find it for you, no school will teach it, no vendor has ever made it and you cannot buy it. Their approach to understanding alternative data includes moving away from a vendor-centric model and towards instead towards an alpha centric one. The major categories include: (1) Speed data focused on getting same information but faster (e.g. credit card transactions); (2) Granular data breaking down aggregation units with some additional information by looking at smaller pieces (e.g. satellite imagery); (3) Curated data that is better cleaned/normalized/longer dated/point in time (e.g. cleaned 13-F filings); (4) Distinct data that is either never previously digitized, did not know you wanted it, was not previously available, not previously created (e.g. CEO speeding tickets). While the barriers to quant have substantially dropped, those to success have commensurately steepened. The speaker argues that a successful quant implementation of alternative data will require proactivity, reduction of search costs, curation, scaled operations, speed and deployment scale.

Panel on Alternative Data Investing

The three data providers discussed how their company stands out among the wide array of vendors in this space. They discuss ways in which they help investors in the data exploration process such as using technology to look at multiple data sets at the same time and providing data sets broken down by different demographics. They also discussed the data issues unique to 2020.

Leaving the Station: Credit Electronification following the Equity Blueprint

Quant credit is at a tipping point where it can really see exponential growth in the next few years offering significant alpha opportunities to early adopters. Pioneers in quant equity trading generated excess returns and benefited from a substantial moat in the 80s to mid-90s. While alpha still remains in equities, competition and crowding has limited the easier opportunities. Fixed income, with corporate bonds in particular, are following a similar path to equity electronification with a favorable setup for substantial future growth. The main challenges to credit electronification has been breadth (many cusips per ticker) and liquidity/pricing. Pre-trade price transparency and liquidity in particular are improving but still far from where equity markets are now. However, much progress has been made. For example, ten years ago most credit trades would have been done over voice compared to ~65% of firms trading electronic currently. Covid saw an acceleration of the trend with many market participants seeking liquidity on alternative venues. The unique challenges to running a systematic credit portfolio are models/systems implementation, data extraction/synthesis and liquidity/transactions costs.

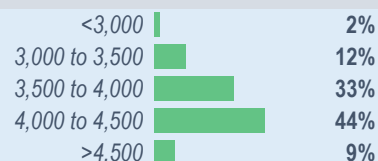
Investor Survey Results

As is traditional during the conference, a survey was conducted on Alternative Risk Premia investing, Big Data, Machine Learning and Macro Expectations. In this conference we expanded the survey to include Risks to Market and Cryptocurrencies to gauge the sentiment of the investment industry. Participation in the questions varied around 200-300 investors. The key findings are summarized below:

Key findings from questions on Current Macro Conditions

- Investors' expectations on S&P 500's yearend level is in the range of 4,000 to 4,500 (44%) with a negative fat tail; a third expect the level to be in the range of 3,500 to 4,000. Almost all (95%) investors expect COVID-19 Pandemic will not subside in 1H'21. Many expect pandemic to subside only in 2022 (45%).
- Most investors expect average VIX level in 2021 to be in the range of 20-25 (44%); followed by 17.5-20 (39%). Very few investors expect average VIX to go below 15 (2%).
- Investors' expectations on 10 year bond yield by the year end is in the range of 1.25% to 1.75% (56%) with a marginally negative view.

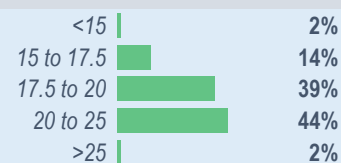
1: Where do you see the S&P 500 by the end of this year?



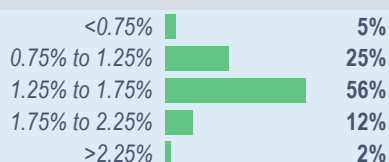
2: When will Covid-19 Pandemic significantly subside?



3: What do you think will be the average level of VIX in 2021?



4: Where do you see the US 10 Year Yield by the end of this year?

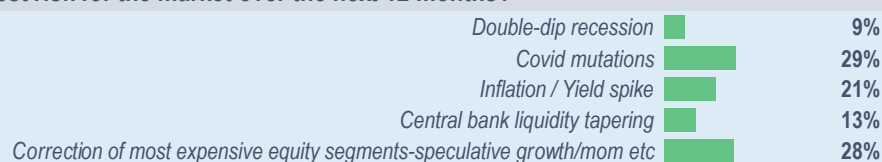


Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

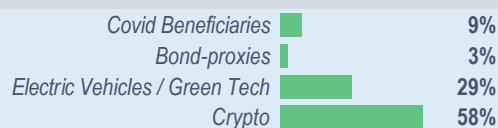
Key findings from questions on Risks to Market

- On major risks to market, investor response was much divided. Most sought risks are: COVID mutations (29%) and correction in expensive equity segments (28%). A fifth fear inflation/yield spike. Few fear central bank tapering (13%) and double-dip recession (9%).
- Interestingly on yield risk, only 10% of participants see the US 10yr yield between 1.5%-2.0% posing a risk to equity market/multiple. 17% do not see risk to equities for 10yr yield below 3%. Remaining 70% of participants expect equity pressure around 2.5% of 10yr yield.
- For market segment in risk, majority see risk in Cryptocurrency (58%) followed by Electric Vehicles/Green Tech (29%). Interestingly only a few believe bond-proxies (3%) are in bubble territory.

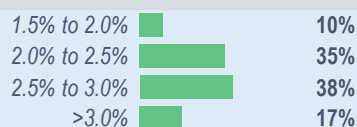
5: What is the greatest risk for the market over the next 12 months?



6: Which market segment is most likely to be in a bubble?



7: What level of US 10 Year Yield could trigger significant equity market / multiple de-rating?



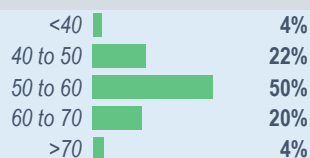
Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

- As for Inflation risk, Investors have diversified approach for hedging tools – Commodities (42%), Energy/Material stocks (32%) and rate products (26%).
- Most investors expect WTI crude to remain range bound at \$50-\$60 (50%) with symmetric view on either side. On average, investors do not expect crude prices to be the main driver of inflation.

8: What do you perceive as the best way to hedge inflation risk?



9: Where do you see Oil (WTI) price by the end of this year?



Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

Key findings from questions on Cryptocurrency

- Few investors trade/invest in cryptocurrency (11%), however most do not (89%). Of those firms who do not invest, most are not likely to start investing/trading in cryptocurrency (78%). About a fourth of the investors personally invest in cryptocurrency.
- Majority of investors perceive cryptocurrency is here to stay (58%) with many perceiving it as temporary fad (21%) and something to avoid (e.g. like rat poison!) (14%). Only a few (7%) expect it to turn into an important asset class.
- More than 3/4th of investors expect tougher stance of regulators on cryptocurrency. And almost all (98%) believe fraud in crypto world is somewhat or very much prevalent.

10: Does your firm trade / invest in Crypto?

Yes		11%
No		89%

11: If not, how likely is it that your firm will trade / invest in Crypto?

Likely		22%
Not likely		78%

12: Do you personally trade / invest in Crypto?

Yes		27%
No		73%

13: What is your opinion on Crypto?

"Probably rat poison squared" (quote from Warren Buffett)		14%
A temporary fad		21%
Here to stay		58%
Will become one of the most important assets		7%

14: Do you think regulators should be tougher in regulating Crypto?

Yes		77%
No		23%

15: How prevalent is fraud in Crypto currencies world?

Not at all		3%
Somewhat		48%
Very much		49%

Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

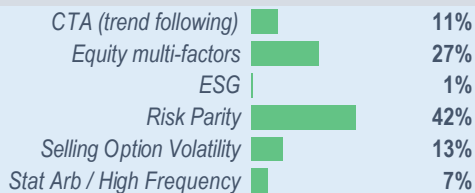
Key findings from questions on Quantitative Investing

- Largest inflows are anticipated in ESG approaches (48%) followed by CTAs (16%). Largest Outflows are anticipated in Risk Parity (42%) followed by Equity multifactor strategies (27%).
- However only a few (11%) believe ESG to provide best opportunities for Quants. Most seek it in Big Data/ ML (31%), EM/China (29%) and systematic credit (24%).
- Most investors (84%) expect Value outperformance to continue – for short-term (51% vs 50% last year) and as beginning of longer term Value cycle (33% vs 18% last year).

16: Which Quantitative investing approach will see the largest inflows over the next 12 months?



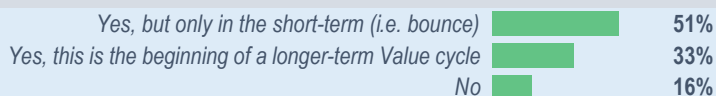
17: Which Quantitative investing approach will see the largest outflows over the next 12 months?



18: Looking ahead, where do you see best opportunity for Quants?



19: Will the recent Value outperformance continue?



Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

- When asked about the use of volatility scaling/targeting, a fifth (18%) of participants claimed no use, lower than last year (35%). Most popular methodology for vol measure being proprietary mix (29%) followed by weighted realized vol (24%). Popular Vol measure applied is closest to 2 to 3 months window estimates.

20: If you use volatility targeting / scaling, what type of volatility measure do you reference?

Simple realized volatility		13%
Weighted realized volatility (e.g. exponentially weighted)		24%
VIX or short-dated implied volatility (e.g. 1-3 month)		10%
Longer-dated implied volatility (e.g. >3 month)		6%
Proprietary mix of implied and realized volatility measures		29%
Do not use		18%

21: If you use volatility targeting / scaling based on realized volatility, which window (or exponential half-life) is closest to your methodology?

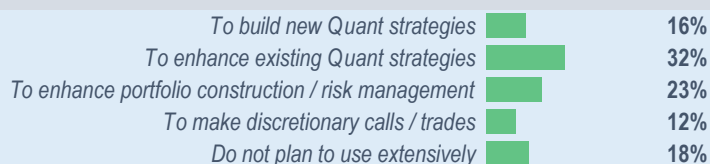
1-month or shorter		13%
2 to 3 months		30%
4 to 6 months		14%
7 to 12 months		10%
Longer than 12 months		12%
Do not use		22%

Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

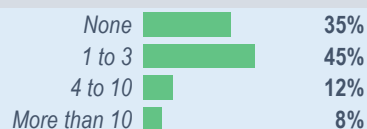
Key findings from questions on Big Data/AI Strategies Adoption

- Investors perceive big data/machine learning as a tool to enhance existing quant strategies (32% vs 28% last year), to enhance portfolio construction / risk management (23%, same as last year), to build new quant strategies (16% vs 18% last year) and to make discretionary call / trades (12% vs 18% last year).
- The number of alternative data sources evaluated by conference attendees (and their immediate teams) remains low. 45% had analyzed between 1-3 new data sets, while 35% had analyzed none at all. These figures show no change in evaluation efforts since last year.
- Majority (~50%) of investors have found no Alternate Data/ML based signals yielding any alpha. 44% of investors were successful in generating few (1 to 3) signals and 6% generated more than 3 signals. These proportions are same as last year.

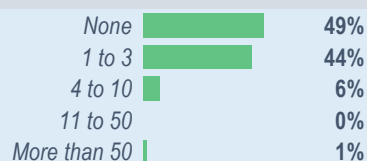
22: How do you plan to use Big Data / Machine Learning within your investment process?



23: How many new/alternative data sets have you (your immediate team) evaluated in the past year?



24: Of the various Alternative Data / Machine Learning based signals that you have researched, how many are actually yielding alpha?



Source: J.P. Morgan Macro Quantitative & Derivatives Conference Survey

Detailed Notes on the Presentations

Keynote

Summary

- The fireside chat started with a discussion on 2020. The speaker highlighted the narrative was that Quant had a poor 2020. This was certainly true for quant equity though quant credit, fast strategies or long-vol strategies in general, futures trend-following and trend following in other macro had a good to exceptional 2020.
- More interestingly, if you look at the performance between discretionary macro managers vs. quant macro managers the average is about the same. Yes there were some who shone in both camps but by-in-large the performance was not significantly different. Trading in Chinese markets was exceptional though Quant equity - a fairly large portion of quant overall - had a poor year which generated some headlines.
- Moving onto a discussion on Value, the speaker recapped that Value was very difficult in the US and outside: the rally in November was strong for most though the Momentum reversal and sell-off underlying the rally was overwhelming for many managers.
- Broadly, trying to forecast when Value will recover is near-on impossible. We'd like to think we can forecast Value though forecasting and timing Value are very difficult. Secondly, there are a number of things which challenge Value over time: Value is based on accounting which came of age in the 50's and 60's though as we have moved to a more technological world, these have become less-relevant. The advice is to allocate to Value though don't over allocate, especially in a world where you can allocate to other things which have better Sharpe ratios.
- Most of us have an emotional attachment to Value: Value is more attractive / instinctive - think of how we buy items in a supermarket where we're more Value (this is cheap) buyers than Momentum (the price is increasing) when it comes to buying apples. Another key aspect is that when Value recovers it can recover sharply, so given difficulties in timing how much exposure should you have being aware that a reversal could be fairly rapid?
- Tackling the timely topic of the bond-equity correlation, the speaker highlighted this is one of the most important numbers for fund managers and portfolio construction. We have lived in a world that as equities rose, bonds were there to save you: history has shown occasions that both equities and bonds fall at the same time, on more occasions than is often thought.
- So whilst we cannot say what the number will be in 2021/2022 we update this number many times a day. This proves to be very helpful and essentially helps address the question of 'do you have the tools to understand diversification failure?' Using such methods we can come up with an actionable short-term forecast. The challenge of using daily / weekly data is that by the time you have enough data you are already too late, that is to say you're bound to be ~20 days too late.
- The auto-correlation on volatility is very high compared to returns so it is much easier to forecast volatility. The US equity market ergo the S&P 500 is the largest such driver of volatility for the rest of the world, and has become more concentrated over time both sectorally and by stocks. The concentration has been into less diversified areas of the market and out of more diversified areas of the market. So the speaker asserts it is not particularly brave to say the VIX will remain elevated or high. For that to miss we would need to see i) the tech sector become less volatile, and ii) readjustment.
- The implication of volatility remaining high are fairly large a) 60/40 balanced funds – a core building block – have been running at a vol of 5 for the last few years, and is now running at 10, you may need to use leverage as maybe 10 is no longer enough, b) hedge funds used to running mid-teens in 2000's are now running <10's, and c) for position sizing: how big do you want your position to be if vol is elevated?
- Discussing alpha and opportunities into 2021, the speaker started by defining alpha as the stuff that is necessarily hard to do. What used to be hard to do is now easy e.g. smart-beta and tools on the Bloomberg terminal. China has been interesting

over the past few years though has limits on what foreign investors can do but is extremely liquid (think Chinese macro markets and Chinese commodities markets). An area where the speaker saw a pickup during the pandemic was text. Machines are better at processing images though on reading text? Here lie some opportunities. The importance of text and NLP are exciting areas. Finally, as OTC markets become more electronic it makes markets such as quant credit easier and attractive.

- The discussion moved onto cryptocurrencies. The speaker noted it was difficult to place a fair value on a crypto asset. One attractive aspect is that volume is up a lot so not only can you have a CTA here, you can potentially market-make. It is more of a technical market and dominated by retail. It must though be noted, the speaker said, crypto is particularly bad for the environment: i) not socially useful, ii) ESG impacts are disturbing and is iii) exceptionally environmentally unfriendly.

Q & A

- Q: If market timing of factors is too difficult, is it more useful to use regime based analysis and use strategies of factors that work in that regime confirmatory vs. anticipatory?
A: Looking at more technical data, there does clearly appear to be momentum in factors e.g. value in Value. So you can, the speakers says, moderately use technical factors to help. E.g. time-series momentum: at a fund-level the challenge is how do you make it work? It's tough to beat $1/n$ i.e. equal-risk.
- Q: How do you see Value and other factors performing going forward? Is it comparable to what we have seen in the past? What range of Sharpe ratios i.e. risk-adjusted performance can be expected?
A: The speaker remarked this is a very good question. The issue with almost any asset is that when it becomes attractive the forward looking returns will almost always be lower. Take a look at Bitcoin as an example. Future returns will be lower than the past, so factors be they market-neutral, long-only the future returns will be lower. The long-term Sharp ratios will be in the 0.2-0.3 range than people's expectations of 0.5-0.6 range. On Value, the speaker reiterated his earlier comments and does not agree with the idea that buying cheap stocks will not work again.
- Q: What time windows should we consider for correlations? Is it 6m or 12m, or intraday? How to calculate longer term trends?
A: The speaker highlighted the importance of the estimation windows: they really matter. The 1m, 3m and 6m volatility measures are all different. Similarly with beta, calculated one way it is positive, calculated another and its negative, a third way it's neutral. Moreover, there is no perfect window. The way we tend to do things is we are rapid in our calculations, one of the big challenges of using daily data is that you're using the closing auction which is specifically designed to reduce volatility. So whilst there is no perfect window, you can and should build algorithms which learn what the best window to learn continually, learn how much data to use and re-estimate window size. There is no perfect answer though these are practical steps to take.
- Q: What short-term strategies have been successful in 2020? Are these market-making or alpha strategies? How important is execution capabilities in these strategies?
A: The execution capabilities for short-term strategies is absolutely critical. You may use pipes from brokers, and do not need to use colocation for most strategies though you should be very focused on execution quality. Is it market-making or not? It depends. It can be though does not have to be, certainly when you talk to electronic market-makers some of them consider themselves short-term alpha players whilst others are permanently posting two-way liquidity.
- Q: Can you comment on the use of ESG factors? Is ESG a trend? Is it something that is in fashion or of real value?
A: The speaker said that ESG is a real theme and there's a clear difference between the US and Europe on this, even across the US. Not a fad, something more long-term, with the E taking more prominence over S & G. the speaker does not believe they're equal-weighted right now. These are some things to think about. S can be controversial in some places. Moreover, the data is a challenge. The different data providers are measuring different things so it's very hard to combine and very difficult data to work with. More ESG investing is being done by discretionary managers than by Quant e.g. areas like stewardship or engaging with companies is more of discretionary managers' thing to do compared to Quant. There is quality data out there, and good quants can work with that data. Thinking back to Bitcoin, we can all work with bitcoin, though the environmental damage is pretty hard to get over.

Tail Hedging and Other Defensive Strategies: A Practitioner's Guide

Summary

- The presenter discusses practical aspects of tail risk hedging. It is something that he has worked on for the last 20 years and his focus has really been on hedging equity risk.
- The speaker feels first lesson worth keeping at the forefront of our minds is that client outcomes are heavily path-dependent and most investors have a loss threshold, beyond which the likelihood of making behavioral errors increases materially. The higher is the portfolio volatility and the bigger is the drawdown, the less likely a client is able to stay invested in that strategy.
- In practice buying puts is not a very good strategy. Though 5 & 10 delta puts costs you 1% to 1.5% per annum it requires you to stick during the whole horizon. Investors can quit on the protection quickly and forego the big gain when it comes.
- In practice, the theoretical trade-off between reliability and cost of hedging is affected by frequency of reward. Presenter thinks it is worth having small occasional payoffs. Otherwise what happens in practice is an increased focus on the persistent and prevailing loss and the most likely the outcome would be that the hedge mandate is terminated before it has even got a chance to contribute.
- Most hedges have performed worse in the post- GFC period. Equity put options and long volatility have done generally quite worse in the post crisis period than in the pre-crisis period. Bonds have done quite well in the last 10 years but the presenter has some serious concerns that their defensive properties will extend in the future. Short FX carry as a hedge has worked quite a lot better post-crisis.
- Based on presenter's proprietary model, the real expected return on government bonds in the US is quite poor. The other issue with bonds is that as the yield hits the zero lower bound, there is growing evidence that the sensitivity of bond yields to macroeconomic data actually starts diminishing.
- The correlation of currencies to broad global equity indices has increased post-crisis and expected return for G10 currency carry has fallen. As a result currencies as a hedging instrument looks more interesting.
- With global factors dominating, central bank policies have become much more globally coordinated, so that when something happens in one big economy it is more likely to affect all economies as a result interest rate differentials are responding less to risk-off shocks.
- The transmission of volatility across asset classes remains inefficient. Even during periods of high volatility, relative value volatility opportunities can be attractive. As we observed in mid-February 2020, equity volatility started picking up but there was a two to three weeks period before the volatility shock propagated into bond markets and it took almost a month to reach the Aussie dollar.
- Implied correlation between asset classes is priced based on a backward looking realized correlation. If there are means to predict correlation breaks, then one of the best remaining ways to get cheap convexity into the portfolio is by embedding correlation assumptions into over-the-counter option structures.
- The presenter concluded by noting that hedging strategies, including long equity puts and government bonds, entail substantial basis risk and that the most reliable hedges tend to have the lowest, and usually negative, expected returns. Furthermore, until bond yields have room to fall sharply, other asset classes may provide more potent hedges and a hybrid approach of systematic and discretionary strategies is required to effectively generate convexity.

Q & A

- Q: Given the current macro environment with massive fiscal stimulus in the US and recovering commodity prices, can you please discuss the reflation/inflation theme. What are your thoughts on the medium term outlook on shorting FX carry?
A: We share a positive view towards commodities as we think there is a huge supply problem and demand shock at the same time. As a result assets like the Aussie dollar are likely to be bid up. Therefore stale short DM or EM FX carry is not recommended. There is a high correlation of FX carry strategies to equities, and with volatility staying low, they can still be great hedges for short periods of time. In the hedge toolkit there is nothing strategic in nature and short FX carry is very opportunistic and short term hedge. The only thing that should be strategic is something that has a positive expected return and EM FX and DM Carry shall benefit in the commodity super cycle that we're expecting and hence short carry strategies as hedges are not something we should sit on for a long time. But at the current level of volatilities such strategies could still be interesting short term-for a few weeks or a few months at a time.
- Q: What are your thoughts on active long volatility strategies? Are they viable or possible in a way that does not incur much negative carry but still preserves reliability?
A: Nothing can be 100% reliable, but you can have strategies that are maybe 80-90% reliable. But the client expectations need to be set at the right level. If you allow an active manager to time and to take the basis risk, there is a pretty decent chance that a big accident happens and it happens to happen at a time when you were not hedged. So there is a lot of opportunity in this space, and it is worth allowing a slight compromise in reliability, because ultimately it will cost a lot less.
- Q: Could you comment, just a little bit about, give the audience a sense of how much of your tail hedging program takes place in EM, and how efficient it is versus say DM from a slippage and capacity perspective?
A: Quite often a lot of these liquidity crunches are what tend to cause the problems in various markets and that is exactly what happened in March 2020. So historically hedges are 80% listed/20% OTC, but almost 100% in developed markets. If you are hedging a sizable book (5bln USD), it's just not possible to get the same and the right amount of size and convexity in emerging markets as you can get in DM and even if you can get it then you cannot get out.
- Q. What about put spread depending on the skew on how much delta you can capture versus cost and would that be viable alternative to low delta puts ?
A: It is acceptable not to make money when equities crash, but it's not acceptable to lose too much. And therefore, the hedge has to be long vol as a whole. When skew is high for example, it makes sense to use put spread format. An outright hedge is too expensive at times and then you can turn to using put spreads. Typically it is preferable to have three to five different hedges in the portfolio as it is hard to predict which one will pay off and one way to balance that basis risk is having a variety of different structures like dispersion, cross-asset trend following, equity put and put spreads that all together make more sense.
- Q, Intraday momentum has performed very well last year during the COVID crisis. What do you think is the biggest risk for intraday momentum strategy and in what situation it will dysfunction?
A: As half of the short vol sellers are gone, the appetite to sell vol today is much less than it used to be. With less vol sellers out there, intraday momentum will do less well. Secondly there is a lot of research saying this is going to work and typically when that happens capital flows come in and expected returns drop. As a result the strategy will not have the same sort of Sharpe ratio, as we have seen in the past.
- Q. What are your views on Bitcoin as alternative to gold hedge?
A: From an asset allocation perspective, if you're a wealthy endowment or wealthy person having 1% to 1.5% allocation to Bitcoin might make sense from a diversification perspective. It is very hard to predict which way Bitcoin will go and to be outright bullish. But there is so much momentum that having a small allocation might make sense.

The Consequences of an Inflation Tipping Point for Bond-Equity Correlation and the Impact on Portfolios

Summary

- The presenter begins by highlighting that the correlation between the S&P500 and US treasuries flipped from positive to negative in the late 90s. Since then investors have become accustomed to this negative correlation. However, compared to data over the past 150 years, this presents an outlier. This effect is attributable to a change in investor behavior, as they became comfortable with central banks' ability to ease without stoking inflation. The implications of which are that a renewed inflation threat may push the correlation back into a positive regime, which in turn would impact future asset allocation decisions and risk management considerations.
- The recent effect of correlation between stocks and bonds is explained by modern central bank policy and investors' confidence in central banks' ability to tackle inflation. The 1970s witnessed stagflation, with sustained high rates of inflation, which was tackled by the Fed and BoE strongly shrinking the money supply, which induced recessions into the 80s.
- During the COVID crisis in 2020, we observed a spike in bond – equity correlation as both equities and bonds crashed simultaneously (“dash for cash”).
- Next, the speaker establishes the fundamental relationships of inflation with equities and bonds. Inflation erodes future value of bond cash flows and therefore an inflation risk premium is required. For equities, a controlled increase in inflation is likely positive for equities, but negative for bonds, leading to negative correlation between the two. However, high or untamed inflation is bad for equities as this creates high degrees of uncertainty, lower business activity and the future value of cash flows is eroded. In this scenario equities and bonds would experience positive correlation.
- So why should this concern us? Developed markets have seen massive fiscal and monetary stimulus measures. If inflation rises on the back of these measures and the correlation flips back to positive, then the bonds no longer act as a hedge for equities and future bond returns look poor. Sharpe Ratios for standard 60/40 portfolios (equities/bonds) would lower in a positive correlation scenario.
- Based on data over the past 150 years, the correlation (Between equities and bonds) has been positive for the majority of time up until the late 1990s and the speaker attributes this to the fact the most developed market economies followed the gold standard over this period.
- Further the speaker highlights that this effect is consistent across DM markets globally. However there are some exceptions like South Africa and Italy where bonds still trade more similarly to equities. Further, the correlation flip is present across all tenors of US treasuries.
- For corporate debt the effect of the correlation inflection is also present, with a positive correlation to equities prior to 2000 and negative thereafter. Though this does not apply to CDS indices, which exhibit a high correlation with equities.
- Is this simply a tail effect? Even when capping the returns data to reduce the impact of outliers, the effect persists. Similarly when observing the returns of bonds and equities on the most extreme down days of equities split by pre-1998 and post 1998 periods, the inversion in correlation is also highly apparent. Conditional probability returns for bonds, based on equity returns also evidence the same inversion of correlation structure over this time period. These results suggest that the correlation seems to be the same between the bulk and the tails.
- Finally, the presenter details an approach to model the correlation using inflation and risk (volatility) as explanatory variables. The results of the regression indicate that the beta of inflation is positive and risk is negative. These results are consistent with the observations with about inflation and correlations.

Q & A

- Q: Can the past 20 to 30 years of negative correlations between bonds and equities be seen more as a flight to quality, without any assumption about central bank policy response and inflation expectations?
A: To me that's a question about tail correlation. We have convinced ourselves that this is not really a tail effect it seems quite stable, no matter how you measure that correlation.
- Q: In anticipation of a shift in correlations, what are some interesting asset classes you are looking at? What about Bitcoin?
A: Buying TIPS or inflation swaps is clearly a way to hedge inflation. There may be limited liquidity in those markets. Buying hard assets such as commodities and property is another way to hedge inflation. Bitcoin may be an option, historically people would buy gold and due to the fixed amount available it could be a good hedge. Personally, I like trend following of commodities, which was a great strategy through the 70s. This strategy has done well with the rise of commodities over the past couple of months. In terms of building in hedges that include trend following strategies that embed more defensive features and on the other hand strategies based on VIX futures.
- Q: Do you think equity Value or equity Energy could act as a good hedge in this scenario (Correlations breaking out)?
A: You do get some features in Value stocks that would suggest that they can be good in a very strong reversal. However this is not really stable or robust. I would not consider that to be a very good hedge. With regards to Energy, inflationary pressures have pushed up crude more recently, but I do not know whether that will be stable going forward.
- Q: Did you look at a model for correlation based on inflation and volatility for other countries too, or only for the US?
A: We only did that for the US. The overall pattern may well be the same.
- Q: How significant are the betas presented in the slides?
A: They are statistically significant.
- Q: Is there a threshold that inflation needs to pass for the correlation to flip, or is it an accumulation of time, and if so, how much time is required above a certain inflation level is required for the flipping in correlation?
A: This is something that is very difficult to quantify, as it is a behavioral effect – investors building up confidence in central banks to ease when they need to without stoking inflation.

The Dynamics of Equity-Bond Correlations at the Zero Lower Bound - Implications for Asset Allocation

Summary

- The speaker starts the presentation by drawing attention to the importance of equity-bond correlations as an input for asset allocation. Over the past 20 years asset managers have benefitted from the negative correlation between these two assets. However, when viewing a longer time period the correlation has not always been negative. Prior to 2000, there was a 40 year period of positive inflation. This leads to two takeaways, the first being that there is no guarantee that equity-bond correlation will remain negative. Secondly, and more importantly there are long lasting cycles to correlations.
- The Pre 1952-1964 period was similar to the current period and was marked by yield curve control by the Fed, low yields and low inflation. Growth during this period was also low with three recessions occurring over this interval. Therefore it is not unsurprising that correlations behaved in a similar way.
- Conversely, the period from 1965 – 2000, was dominated by supply shocks, very high inflation and active monetary policy. This type of environment leads to high correlation, whilst low inflation and stable growth most likely lead to negative correlation.
- Next, focusing on the past 20 years the presenter highlights the strong negative correlation over this period as well as the impact monetary policy can have on this correlation. Noting examples such as the Taper Tantrum (2013), Rise in European Bond Yields (2015) and the 2016 presidential elections, where the correlation turned positive for brief periods. He frames the monetary policy in the econometric context, as defined by the Taylor rule (e.g. monetary policy is tight when it is above where it should be according to the Taylor rule)
- Comparing correlation matrices for various assets between 1980-2000 and 2000-2020, the speaker draws attention to the changes in US10Y with S&P as well as WTI with S&P. The latter being explained by oil shocks in the 80s having a negative impact on equity markets resulting in a negative correlation, whilst in the 2000-2020 period, oil was more driven by better economic conditions which formed a positive feedback loop with equity markets and in turn helped drive the oil price, resulting in positive correlation.
- The impact on a mean variance efficient stock-bond portfolio by a return to the previous correlation regime could lead to a Share Ratio degradation of 25%. This would also lead to a massive shock for market as trillions of dollars' worth of hedges become active exposures. Additionally, in this scenario bonds will command a positive risk premium.
- The presenter then introduces a Vector Auto regression Model (VAR), linking the yields and lagged yields to stock and lagged stock returns. The sample needs to split into two phases 1970-1999 (P1) and 2000-2020 (P2), due to large regime change. Over P1 the correlation between stocks and bonds is 26%, 10Y yield volatility is higher and generally bonds lead stocks. For P2 the correlation is -32%, the volatility in 10Y yield is about 20bps lower and there is discernable lead/lag. One takeaway is that when bonds are driving the markets, they can create positive correlation between stocks and bonds.
- A drawback of this VAR model is that it does not identify the factors that are driving stocks and bonds, and hence not what the factors are that are driving the correlation. One potential solution is to run a regression of yields and equity returns against macroeconomic factors. This however has the drawback that markets have a far higher data frequency than macro data, which obscures inference.
- Instead the proposed model is built on knowledge of stylized stock and bond reactions to macroeconomic shocks. For example a positive growth shock would increase yields and stock returns, i.e. create a negative correlation between stocks and bonds. Additionally, inflation shocks are bad for both stocks and bonds.
- The presenter further details the dynamics of the model by showing a table that summarizes the impulse responses of changes in growth, inflation, growth risk premia and inflation risk premia for both stocks and bonds (2Y, 5Y and 10Y). As

an example he cites that stocks and bond yields move in the same direction when there is a shock to growth. Further bonds have a negative growth risk premium, when growth is bad, bonds rise (yields fall). Monetary policy can be detrimental to both stocks and bonds, tightening above levels indicated by the Taylor rule, can create positive correlation between stock and bond returns.

- The output of this exercise is given by variance decompositions of the stock returns and bond yields, again split into the two phases. The first key result highlighted that in P1, (1980-2000), the inflation factor accounted for 70% for the variance of the 2Y yield, compared to a value of 50% in P2. More strikingly for the 10Y, up to 30% of variance was due to inflation from 1980-2000, however in that value is only 4% over the last 20 years. For the S&P500, in the 1980s the main driver was inflation shocks and risk premia, whereas in the last twenty it was growth risk premia.
- Next the presenter illustrates the decomposition of the stock-bond covariance, noting that in aggregate the four drivers show a positive correlation pre 2000 and a negative correlation post 2000. Additionally, in the period prior to 2000, the primary driver of the stock-bond covariance was the inflation risk premium, in contrast in the post 2000 period, the main driver is the growth risk premium.
- Finally, an analysis of the Zero Lower Bound effect on conditional bond betas to rolling equity monthly returns below -2%. When yields are high, the betas are positive, conversely when yields are low the betas are negative, and bonds act as a good hedge. However as yields approach the zero lower bound or get negative, bond betas do increase again, forming a sort of “U” pattern.
- In conclusion stock and bond dynamics and their correlation are well explained by the interaction of growth, inflation, and monetary policy and the risk premia associated with these factors. High and volatile inflation is bad for bonds and stocks and induces a strong positive stock-bond correlation.

Q & A

- Q: Do you expect equities as a good hedge, as inflation and yields higher from their current levels? And if so, at which level of yield or inflation do you expect this to reverse and equities to become a poor trade?
A: I do not think so. We can currently describe the Taylor Rule in the US as so form of a non-linear function, where we have the 1.5 times the inflation gap, and we do not have any coefficient for growth, and we know that rates are not going to go up until we are above 2% (inflation) for a while. Maybe in the short run some higher inflation can be good for stocks, but I think a return to very high inflation, persistent inflation, would be very detrimental for stocks, because it will induce a very severe tightening of financial conditions. Then it will bring up all the bad things, that quantitative easing has done. If you think about quantitative easing as a massive asset swap of long dated securities for short dated securities. Where it now looks like the whole government now is funded almost overnight. We have replaced long dated bonds for interest paying reserves, which look like T-Bills. So I, unfortunately, do not think so. Maybe for a very short while, but eventually, if you do have a very significant shock to inflation, I think equities are going to suffer as much as bonds
- Q: Do you have any comments or thoughts on risk parity strategies, under the context of what you just described, an inflation shock and a break in equity bond correlations?
A: Yes, It is one of the key strategies that will be severely challenged by this return to a different correlation regime. As we know, the idea behind risk parity is that a portfolio of 60% stocks and 40% bonds, has 95% correlation to stocks, so you need to have three times as many bonds to make them more equal. Guess what, that does not work very well, when you have very low bond yields and you have positive or no correlation between stocks and bonds.

The Evolution of Quant Macro: From Technical Analysis to Systematic Credit

Summary

- The speaker started the discussion that when evaluating a strategy the fundamental law of active management is a tool to do just that where the IR (Information ratio) is the strength of the signal over the number of independent bets. The key emphasis is on the independent bets / forecasts in the breadth measure of the IR.
- So how do we use it? A discretionary L/S managers focusing on 30 stocks trading once a month would have ~10% alpha, equity stat-arb with 2000 stocks trading twice a week would have 0.4% alpha and for say a high-frequency shop with 2000 stocks trading every 10 minutes you need 200x less accuracy to get the same alpha. So we find from this cursory analysis, you would want to take as many independent bets as you can.
- In the beginning there was fundamental analysis which focused on short-term analysis (*what is the value?*) alongside technical analysis which looked at more long-term signals (*what are patterns?*). It is not then surprising, the presenter remarked, to find the first systematic models came in the commodities space with Vannerson's TCS (technical Computer System) in 1970 followed by Richard Dennis and the Turtles in 1984.
- People have been trading equities for many, many years. In the mid-80's the idea of trading pairs of securities gathered pace though again not without a number of questions: how do you identify these pairs? When do you get in? When do you get out? Do you always bet convergence? Etc.
- Academics in finance were also looking at risk-reward and capital efficiency. In CAPM (1960s) returns of an asset can be decomposed to a β to the market, whilst in APT (1976) asset returns are explainable by many factors. Barra (1970s) expanded this analysis to provide a better estimate of risk to country, industry, styles and ultimately the asset specific return.
- Thinking back to macro, we have a small universe of ~100 heterogeneous and uncorrelated assets. So what do we do? We can treat futures individually, look at combinations of futures, look at the correlation structure, build factor models by asset class, or build factor models for universe, or even look at expanding the universe.
- The presenter then took an example of trading credit. You can trade individually or leveraging knowledge of the fundamental law of active management, you can create spreads (thus increasing the permutation / combination space). You create more bets using bonds on different maturities i.e. modelling the yield curve. Ultimately you would thus be trying to understand the correlation structure of the yield curve moving us closer to the promised land of equities with its 1000's of bets.
- Systematic credit is the area of the bond market with profligate assets suitable to such efforts. Systematic credit, the speaker defined, is essentially corporate bond stat arb. A \$10 trillion market with \$2 trillion issued in 2020, we can apply our equity stat-arb machinery. Now we can take thousands of bets.
- A question which frequently follows is why? Why now? These markets have been around for some time, why the effort now? The presenter highlighted that with the electronification of bond trading, open trading of credit has increased in volume from \$1 trillion in 1Q18 to \$1.5 trillion in 2Q20. This alongside all-to-all trading, portfolio trading, increased liquidity, increased transparency and the proliferation of structured data provides a novel opportunity.
- Though, the speaker cautioned, why doesn't everyone do it? There are a number of challenges including i) assets: bonds are more complex than equities, there are a lot more of them, and managing the securities master document is non-trivial, ii) data: is much dirtier, with vendor reliability and timeliness issues, and finally iii) trading: a fragmented market, often manual with high t -costs.
- Systematic credit allows us to do more bets according to the fundamental law, so what's next? There has been an increase in global quant operations within sports betting think Moneyball. Moreover, marketplace lending, an initially niche area has

now seen increasing technology disintermediation of banking. Alternative lending platforms allow loan investors to take thousands of bets. An interesting area for mainstream Quants though, the speaker noted, you buy and hold so no trading (yet), small but growing, and more active than passive investing.

Q & A

- Q: What would be an estimate of the size Quant credit relative to the Quant equity market? In terms of absolute alpha opportunities or AuM?
A: Systematic credit is in its infancy compared to equities, as more people come into the market this will continue to grow though currently the market is exceptionally small compared to equities.
- Q: What range of Sharpe ratios can you expect to see in corporate bonds stat-arb?
A: 1.5 – 2 is reasonable and plausible.
- Q: Is marketplace lending the same as p2p lending? Many firms have been accosted in China. What are your thoughts on regulations?
A: Marketplace lending is p2p lending. The first platform was in the UK, though the US made them popular. There are a plethora of platforms internationally though with China, a number of platforms have been opaque so investors shied away.
- Q: What are your thoughts on applying machine learning to stat-arb trading? Are the expectations too low or too high?
A: The presenter commented that machine learning is a tool, there are very many tools which are useful. If there is non-linearity then it may make sense to use. It is strange when people use it religiously 'we must use it', or 'we have to use it'. There are instances where regression works better in some cases. Machine Learning has its place but not blindly.
- Q: What is the view on corporate credit factors? Are they analogous to equity factors?
A: The speaker responded by saying in some extent yes. There are companies which provide risk models into credit.
- Q: What is the optimal frequency for systematic credit strategies?
A: The speaker replied it depends on the inefficiency you are tackling, what data you are using, how you will trade, etc. so a range of perspectives.
- Q: The return structure of credit is more complicated [than say equities]. Is it better to bet on total returns/absolute returns, a spread or both?
A: The speaker replied it would be best approached as you would equity stat-arb.

Quant Equity Investing - Cyclical Influences, Secular Trends and Performance Implications

Summary

- In the last decade much capital and risk had been committed to Quantitative factor investing but the rewards have not matched the expectations. With this introductory remark, speaker lays down the structure of the talk. It would include clearing misunderstandings and misconceptions around what drives a factor's performance; followed by examples of different drivers for select factors.
- Quant strategies or as a matter of fact most strategies would work in specific environments and not work in others. 'Good' and 'Bad' environment is specific to each strategy.
- Equity exposure was taken as the first example. Major drivers would include - growth in economy, growth in earnings, and policy support from monetary or fiscal authorities, technical pressures like buying/selling imbalances.
- Extending this framework to Value as an investment strategy – Value is essentially a convergence strategy where expensive stocks revert back to more justified multiples and cheaper stocks get re-rated closer to their justifiable multiples assuming they have no issues around balance sheet impairment etc. The drivers may not reflect strong relationships on shorter period but would be more justifiable on longer periods.
 - Nominal economic growth benefits Value factor.
 - Value dispersion is another driver of Value factor returns over a longer period.
- Low economic growth, despite continuously increasing value dispersion, has resulted in poor Value performance in recent years. Are there some structural changes in the industry?
- Recent decade had seen huge changes in factor investing industry. With availability of data, processing solutions and packaged instruments, factor exposure is very easily available. Risk premia is now very easy-to-obtain and completely commoditized. On the other hand, active management still comes at a much higher cost and effort.
- This over time commoditization of smart beta from a difficult-to-achieve to abundantly available has resulted in misplaced expectations. This has caused huge inflows and outflows in these strategies recently.
- Also there had been bifurcation in evolution of the factor investing approaches – (1) Improving efficiency of participation in the smart beta factors; (2) Evolution of smart beta strategies into more differentiated alphas strategies, with the intention of making them behave as smart beta would do 20yrs ago.
- Innovative differentiated factor strategies continue to get rewards in the recent periods. Speaker demonstrated this with an example of industry momentum strategy and how a differentiated strategy performed better in recent periods.

Q & A

- Q: How to reconcile this view with that of AQR as Value not being crowded?
A: From our perspective, the discussed cyclical influences like lower economic growth is unrelated to crowding. Narrower dispersion would imply crowding but we see higher dispersion. Differentiated approaches may still be adding to the crowding but there is more of a market efficiency element than crowding.
- Q: Please elaborate on differentiated approaches. How to achieve them?
A: Smart beta and Differentiated Alpha is not the same. Anything differentiated would be difficult to implement and achieve than any commoditized Smart Beta. Differentiated Alpha can be attained by incorporating alternate data, more innovative/sophisticated calculations in re-designing the simpler strategies. There can be lot more approaches.

Pension Fund Panel: Quant and Risk Premia Investing

Executive Summary

Dobromir Tzotchev from J.P. Morgan moderated a pension fund panel of risk premia. The panel consisted of representatives from AP7, BT Pension Scheme (BTPS) and Teacher Retirement System of Texas (TRS)

Q & A

- Q: What objective are you trying to achieve by employing risk premia in your investment process?

A: **TRS:** It is an extremely attractive portfolio asset. Risk premia strategies have positive expected returns, can be constructed to be uncorrelated and they are also scalable and leverage efficient. From the portfolio theory perspective, risk premia interact very well with the standard 60-40 style portfolio where the primary risks are global growth or equity growth and rate/duration exposure. If we can find an asset which is scalable that also has a positive yield and is diversifying then that asset is an extremely attractive proposition.

A: **BTPS:** One of the areas that I am responsible is the hedging of our equity and rates exposure. We primarily use risk premia to pay for equity protection and on equity protection we are just buying puts. So we need to create a risk premia portfolio that works in relation to our deficit. On risk premia side we make sure we build something uncorrelated to rates and equity exposure but maybe not uncorrelated in traditional sense as we are focusing on tail risk. We like to do strategies which are uncorrelated with tail risk events in equity and rates. That is where risk premia fits very well and can be used to pay for equity protection.

A: **AP7:** AP7 is quite a unique state pension fund as we manage two different funds: Global Equity Fund and a Local Fixed Income Fund. For that reason the current perspective of cross-asset risk premia is out-of-scope but risk premia is still a vital pillar for our global equity fund. We have quite specific ambitious long term target return and hence a high risk tolerance. Risk premia primarily serves us from a diversification perspective and it is more the driver of the overall risk adjusted return for the portfolio that is important for us. As the universe is very broad and diverse, before we start to invest we try to define our own objective function and also the strategy specific criteria and preferences. Secondly, we try to breakdown strategies into the various components of the value chain like IP, execution, financing and tax. And then we group them into specific constraints. So to speak we try to fit our own world into the provider's world. Obviously we know that two strategies can appear very, very similar but once you start to dig deeper into them they can be quite different from one another. It requires a very granular due diligence process which can be tedious but tends to pay in the long run. Staying true to yourself is also important: there are so many views of how risk premia should be done and also contrarian views as well. Another thing which is quite specific to us is that we have very high flexibility in the way we take the exposure which is also quite unique - it can be funded or unfunded, internal or external, we can use long only product or beta linked product or long/short product.

- Q: What are the main lessons and takeaways from 2020?

A: **BTPS:** It really was not a challenging year for us—maybe we were lucky or maybe we did a good job. I think what we did right was portfolio construction and really trying to achieve what we want to achieve – in our case avoiding big drawdowns in relation to equities and bonds. When we look at our portfolio construction we really managed to avoid big drawdowns by having a statistical approach and our portfolio construction is based on CVAR to a large extent. Strategies that we believed in underperformed, strategies that we did not believe in, performed well.

A: **AP7:** It depends on how you embarked on risk premia in the first place – whether you approach risk premia as a sort of an alternative return stream or approach it as a risk premia in addition to other risk premia such as the traditional equity risk premium for example. And in our case, it has been more of the latter and our assessment period and patience have been quite aligned with the long cycles that risk premiums can have. The biggest test is to evaluate whether your organization and your stakeholders are aligned. Another big takeaway from this year is that you have to scrutinize and be critical and at the

same time you have to stay true to your objective function. You have to frame the process in your own horizon and the analytics, the review process and the internal capabilities in this field are critical. Going back to our quite rigorous due diligence process, you get some clear advantages from having done all that hard work and that tends to be even more important during crisis times. Also you need to keep an eye how the overall client segment is reacting to the underperformance.

A: **TRS:** We run a fairly classical diversified multi asset class portfolio. One of the big takeaways is the significant change in the rate environment and in particular the collapse of the yield curves that seems to have affected nearly every asset class, even in a long-short format. In single name and equity index, the very far dated discounted cash flows had almost no value when longer dated yields that are used as a discount rate were high. And with a massive fall in long term rates these far dated cash flows became very valuable in relative terms and standard value measures were not really capable of dealing with that. It is also important to think about what these risk premia really are, some of the risk premia are really risk premia: for instance things that have a seemingly very high yield are often associated with distress and the opposite things that have very high price are often associated with growth. Potentially one avenue could have been value neutralized for growth. And in terms of how the change in the yield curves have affected other asset classes, it has also affected FX as FX carry is associated with short term interest rates and it has also affected rates carry where the curves are not only lower but also flatter.

- Q: We know that some risk premia strategies are supported by strong academic backing and long term track records. Are you willing to take a longer term view and accept a period of underperformance especially in the **case of equity risk premia**? And more broadly, even if we look outside of equity risk premia, we know some cross asset risk premia strategies and portfolios have been challenged. What do you think are the main reasons for the underperformance?

A: **AP7:** It is not only about getting your own acceptance for the underperformance but also everyone's acceptance for the underperformance. Although the long term expected return should be positive if we think in terms of risk premium (and not as a return stream) obvious risk is periods of potential prolonged underperformance. One of the dangers is the community to shift or give up its anchor points and their original philosophy because of trying to cater for new market dynamics and as a result deviate from the original academic side of things. It is about finding the link between the objective of the strategy and the output of the strategy and if that link is broken, you either dilute the purpose or you should relabel.

A: **TRS:** We personally still have a tremendous amount of conviction in the major themes of the signals that underpin these risk premia like carry, value, quality, momentum and mean reversion. These can be called risk premia or also be called thematic quantamental or disciplined liquidity provision and just to reiterate, we do have conviction in those. Investors at the highest level, the board that effectively calls the shots need to understand and believe in the investment thesis. If people understand the investment thesis and they believe in it, then even, when performance is poor investors will stay. It is easy to believe in things when the returns are positive and when returns are negative, it definitely promotes deep retrospection and people are validly more critical. There is a broad menu of signals and some are higher conviction signals than others. So some are true risk premia and some are behavioral anomalies and some are sort of structural market anomalies. The due diligence process and conviction in the investment thesis are really important.

A: **BTPS:** I think underperformance is probably driven by central banks coming in which basically means that strategies that are based on rates carry and rates differentials are not working. Tolerating underperformance is a bit of philosophical question. There is a lot of research which shows that it is really hard to time risk premia. So that really means that you should be able to go through long times of relative underperformance, which then works really well for pension schemes because generally they are not very MTM sensitive. You can also identify a new strategy, you can put that new strategy on and then it starts to underperform. So question now is whether you should get out - because we really do not know if it is poor design, poor backtest or bad luck.

- Q: We are operating in a low yield environment which is posing challenges not only for income generation from traditional risky assets but also for income generating risk premia? Is there still a place for income generating risk premia or shall we completely focus on defensive ones and use them as a kind of statistical tail hedge protection?

A: **TRS:** Sometimes those are the same strategy – think of buying vol and selling vol. Risk premia can be put into a couple of different categories in terms of the risk profile. Some risk premia have a systematic risk profile - for example FX carry

will have a sensitivity to global growth so there's coincident tail risk or like beta exposure. That is the type of risk investors don't always want to bear and then there is an idiosyncratic risk that can be compensated. These types of strategies which provide compensation for idiosyncratic risk exist, there is a yield to be harvested and they are also particularly attractive to a portfolio. One example is in commodity markets, where pension funds can bear the idiosyncratic commodity risk.

A: **BTPS**: We are still trying to use risk premia to generate income to buy equity protection which gives us a particular profile. And on the equity side the hedging is done via equity puts. So we are looking for stable income generation and we need to make sure that we do not lose too much in tail risk events. But we can lose money, it is a part of the strategy.

- Q: What is your opinion on the current and future innovation in the risk premia space?

A: **TRS**: Innovation in the risk premia space reminds the standard evolution of a lot of common revolutionary products like airplanes or cars or 100 years ago. The thematic investment classes like value, momentum and carry have not really changed, but every single component of the pipeline has got better. The data sets have become better and bigger, the signals have got more polished, the portfolio construction has become much better and execution has also been enhanced. The research process is also potentially going to get much better with the introduction of better collaboration tools- for instance the roll-out of code sharing platforms is a material advancement. There are also new classes of signals coming out. Higher frequency signals are now much easier to handle. There is also a whole class of flow strategies which are not well covered and can provide a great opportunity going forward.

A: **BTPS** : In the past lot of the risk premia probably were grounded to academic research but now more and more risk premia strategies are coming from the trading floor - like intraday, dispersion strategies and correlation trades. Those strategies have a good story as well but have not been well researched so far. There is not much belief in machine learning and high frequency is another ball game. Credit risk premia is another potential innovation with the increased availability of data. Credit indices and baskets have not worked that well, it is still difficult to trade single name bonds in a systematic way and more research is needed to assess whether credit risk premia can be accessed via proxies like equities.

A: **AP7**: Risk premia should not be the place where innovation creates revolution. If the risk premia segment comes under further scrutiny then it can be bombarded with AI and machine learning techniques and it can be completely diluted. It is more about taking gradual steps. For some of the risk premia, there is more value in initial part of strategy construction like signal construction rather than the optimization and portfolio construction process.

Rage Against Machine (Learning)

Summary

- In the presentation the speaker gave a practitioners/business view of the current state of machine learning in the field of systematic trading.
- One common idea that investors are searching for is a 'black-box' approach where they can somehow use machine learning to generate alpha without any human input. In his opinion, no black-box can ever completely replace alpha generation. However, he does say that we can think of our alpha-generation process as a factory and it is possible to automate that factory once the ideas are in place.
- He discussed in depth about how "scientific" the typical methods used in the industry are. He says that a good ML/CS practitioner would be horrified at the typical "alpha-hunter" in the systematic trading industry today.
- One common question which he addressed is "how much of alpha signals should machine learning be responsible for?" In his opinion, ML should not be used as the main way of generating the signal, rather ML should be thought of as an accelerant that improves an already established signal by about 15-20%.
- There was a great deal of discussion around how to integrate machine learning/computer science experts into a systematic trading operation. The speaker believes that one of the biggest difficulties with doing this is the political risk. It is often the case that the current workers may believe that the new ML/CS person will automate them out of their job. Furthermore, there may be some significant structural changes needed in the firm in order to get a large benefit from the ML/CS methods and making these changes may jeopardize the current profitability/success of the firm.

Q & A

- Q1: Who is doing ML well?
I cannot mention names but the groups that are doing well are the ones who really understand the problem and are not treating ML as a sideshow but are fully integrating it into the overall process of the strategy.
- Q2: Should we be able to just let Machine Learning figure everything out once we have the architecture in place?
No. You need people with priors who have understanding. You need some market expertise, otherwise you are just data-mining.
- Q3: What is the best way to build an ML fund from scratch?
I am trying to do this now. Everything must be centralize. You need to train everyone to be good coders and you need a very talented group.
- Q4: Should the ML process be so flexible that we can just through anything in and it will be able to figure it out?
No. There is not enough data for this to be reasonable.
- Q5: How does Sharpe ratio improvements compare in ML vs econometrics?
You should think of ML as automating all of the best econometric methods. Doing this should only result in about a 15% alpha improvement.

Is Alternative Data Alternative Alpha? What it takes to make it work

Summary

- Vendor-centric framework for understanding alternative data is flawed being primarily source-centric (e.g. geolocation, internet-of-things, web-scraped) compared to alpha-centric (i.e. how it helps the investor).
- New framework should be: (1) Speed data focused on getting same information but faster (e.g. credit card transactions to anticipate revenue); (2) Granular data breaking down aggregation units with some additional information by looking at smaller pieces (e.g. satellite imagery); (3) Curated data that is better cleaned/normalized/longer dated/point in time (e.g. cleaned 13-F filings); (4) Distinct data that is either never previously digitized, did not know user wanted it, was not previously available, not previously created (e.g. CEO speeding tickets to predict governance style).
- Alternative data should not be confounded with machine learning (minus extreme cases like textual analysis, etc.) which is more focused on finding non-linear patterns that could not have been as easily grasped versus actual new data.
- Speed data easiest to assess using perfect foresight test (if you had the data x days earlier, could you have made money?). The speaker argued that the answer is not always 'yes' since the market may not care about the information, there may be other news on the same date including guidance, the signal might not arrive soon enough for your investment process (i.e. don't trade often enough) or the signal may not have as much weight.
- Granular data value is determined on whether the market actually cares about it, whether it is useful standalone or as a conditional variable and/or whether it is useful for predicting company or some other entity's trajectory. Curated data likely the most underrated with the largest benefit/improvement to hit rates on existing quant models.
- Distinct data has the most attention with a large trade-off between Type I and II errors and fear of missing out given rumors of its success by other funds. There are large associated costs to acquiring the data and extracting alpha signals. Also concerns of future datasets making the signal obsolete/crowded.
- Barriers to quant have substantially dropped however the barriers to success have steepened. Success going forward requires being proactive in searching for alternative data and doing it in a cost-efficient manner as well as managing curation which is expensive and time consuming. Scale does confer an advantage in terms of processing and utilization. Since vendors speak to everyone, speed matters. Small and nimble along with lower capacity strategies are likely sweet spot for making alternative data strategies work (i.e. having data 1-2 days early or being unable to turnover book quickly enough limits alpha).

Q & A

- Q: How many datasets does your firm evaluate a year and what is the conversion ratio?
A: The firm is onboarding (tested/in production) a new dataset at a rate of 2-3 datasets per week. In the last twelve months, the firm has on boarded several hundred new dataset which are being utilized by at least one portfolio manager. In the speaker's view, if the time horizon is fast enough and capacity low enough there is a lot to do with alternative data sets. In order to do this, require scale with legal/compliance department to facilitate negotiations, IT department to process/curate, etc.

- Q: How big is the data team supporting quant PMs and how do you prioritize on potential ROI for purchasing?
A: The data team is fairly large and robust with a dedicated team for just sourcing. Once 'alternative data' is on Quandl, an investor cannot consider it alpha. Large teams focused on extract/transform/load and ingestion with cloud based experts. It is up to the portfolio managers to utilize the data and if no one is, then the contract is terminated. Backtests make it easy to test if the dataset utilized in model is useful versus cost.
- Q: How do you standardize backtest platform and is there a general framework?
A: A bit of an engineering question with a heavy emphasis on how the data is structured and stored and how to make it extractable by a variety of tools. The speaker has developed a robust backtest and simulation structure at even low latency backtesting for individual managers to use/ingest.

Panel on Alternative Data Investing

Executive Summary:

Peng Cheng from J.P. Morgan moderated a panel of Alternative Data providers. The panel consisted of

- Phil Rist from Prosper Insights
- Morgan Slade from Cloud Quant
- Michael Suen from Intelligration

The three data providers discussed how their company stands out among the wide array of vendors in this space. They discuss ways in which they help investors in the data exploration process such as using technology to look at multiple data sets at the same time and providing data sets broken down by different demographics. They also discussed the data issues unique to 2020.

Q & A

- Q1-@Morgan Slade: Which types of data sets are best to use?
A1: (Morgan Slade) We believe that the crowdsourced signals such as social sentiment signals are extremely important now especially as more people are currently day-trading from home during the pandemic.
- Q2-@Morgan Slade: Many clients have reported that they are only able to analyze about 1-3 data sets per year for testing purposes and they may only find 1 that has any value. How is your company able to help with this problem?
A2: (Morgan Slade): We can speed up this process a great deal because our technology allows us to analyze multiple data sets at once.
- Q3: @Michael Suen: How does your company's product and user base compare to those of retail brokers?
A3: (Michael Suen): One major aspect that we have focused on is breaking down investment preferences by demographics such as age, gender, etc. For example, we may find that females are more interested in investing in companies that sell female products. In general, people are more comfortable with investing in companies whose products they know.
- Q4 @ Michael Suen: It seems like your data mostly focuses on people who have never traded before. Why is this?
A4: (Michael Suen): This is just a coincidence. We did not plan for it to be this way, it just so happens that this is the case. However we do ensure that the user base is diversified and representative of US demographic, rather than being young male dominated, as is the case with some retail brokers.
- Q5: @Phil Rist: Tell us about your product
A5: (Phil Rist): Our mission is to do a scientific study of American's consumer intentions/plans. We survey 8000 consumers per month and ask them factual questions such as "Are you going to buy a car this month? Yes or No." We also take into account that the consumer is not rational but that he/she is highly emotional. The survey has always been anonymous. Another important part of our survey is that we don't give the consumer a list of buyers to choose from, for example, "which of these places did you buy from?" Instead, we simply ask them, "Where do you/did you buy?" Because of this, we have been able to pick up on the Zappos retailer early. We were also able to quickly predict the decline of Circuit City because we noticed that it was appearing much less frequently. We didn't start out on Wall Street but now we have 20 years of data and this happens to be a great training set.

Leaving the Station: Credit Electronification following the Equity Blueprint

Summary

- Electronification started with a slow uptake (80s to mid-90s) before exponential growth until today where it is standard. The largest driving forces for electronification were cost savings, price transparency, operational efficiency, anonymity, market access (i.e. size not a constraint to participate), more accurate transaction cost analysis and better regulatory reporting.
- New quant entrants from the buy side were primarily stat/index arb HFs and on the sell side were high frequency market makers. HFs that were early adopters captured excess profits (see HFRI) by optimizing execution before becoming a victim of their own success (still alpha but not as 'easy' as in prior two decades). Early winners were not incumbents (e.g. banks) but rather new entrants.
- Reduced alpha opportunities among quant equity market neutral strategies given rising competition and crowding. Available alpha unable to keep pace with growth of funds trading in the space. Buy side trying to find new sources of alpha through machine learning, AI, alternative datasets, while sell side focuses on speed (i.e. algorithms) as an edge which creates a sizeable moat to new entrants.
- The main problem with credit electronification has been breadth (many cusips per ticker), liquidity/pricing much more difficult but electronification on the rise. Credit electronification growth similar to equities in the late 90s (i.e. ready for exponential growth/adoption), even corporate bonds which have lagged a bit. Note, credit market growth has been outpacing equities for the past 40 years with record issuance in 2019 and 2020 which has made credit electronification inroads appear less impressive than it actually is.
- Pre-trade price transparency and liquidity improving but still far from where equity markets are now (i.e. screen based trading). 10 years ago most credit trades were done through voice but now as much as 65% of firms trading electronic.
- Electronic trading is here to stay with Covid accelerating the trend (March/April seeing more execution on alternative venues in search of liquidity). Alternative venues should offer better liquidity and data at lower costs for market participants which suggests improved execution efficiencies.
- Further market share gains by electronic venues for credit creates opportunities for new class of strategies (i.e. credit stat arb). The alpha sources are not nearly as well-known as in equities (similar to 80s alpha opportunities in equities). Enormous breadth (i.e. security universe) and diversification though liquidity is a slight constraint.
- Challenges still remain around implementing quant credit strategies: 1) model and system implementation difficult with complex data mapping, deep understanding of credit market structure required, need to build proprietary tech/risk tools; 2) data extraction and synthesis difficult since no one-stop shop to extract and trading workflows still disjointed; 3) liquidity and transaction costs high and dealer relationships still important for best execution and liquidity varies by security (i.e. some not traded daily, cleaning data).

Q & A

- Q: How big is the quant credit space?
A: Difficult to quantify especially given the size of the space (structured credit, etc.). Ex-structured credit, probably <1% of daily flows compared to 25-30% in quant equity.
- Q: What are the most popular quant trading strategies and over what time horizons?
A: The most popular tend to be levered credit (e.g. through structure). Horizons tend to be quite long (months/quarters/years). A growing area in the space is systematic credit which tends to have 1-3 month time horizon in investment grade and 3-6 months for high yield.

- Q: In terms of the global trend, are you seeing the same things in the US vs. Europe?
A: Yes, we are seeing a similar trend in Europe but more data problems (e.g. no Trace) and fragmentation. The presenter sees better opportunities in the US versus Europe.
- Q: How much overlap in securities coverage between venues – do you need to have multiple relationships for best execution?
A: Best execution requires being across all the venues. Market leaders are Market Axess with TradeWeb and ICE in the running.
- Q: Rising interest rates could inhibit further credit issuance, do you see any challenges to systematic credit/liquidity backdrop?
A: Not necessarily. Liquidity tends to be dominated in newest issues. Rising interest rates could actually increase interest in the quant credit strategies given traditional credit's long duration bias.

Risks of Common Option Strategies

Risks to Strategies: Not all option strategies are suitable for investors; certain strategies may expose investors to significant potential losses. We have summarized the risks of selected derivative strategies. For additional risk information, please call your sales representative for a copy of “Characteristics and Risks of Standardized Options.” We advise investors to consult their tax advisors and legal counsel about the tax implications of these strategies. Please also refer to option risk disclosure documents.

Put Sale: Investors who sell put options will own the underlying asset if the asset’s price falls below the strike price of the put option. Investors, therefore, will be exposed to any decline in the underlying asset’s price below the strike potentially to zero, and they will not participate in any price appreciation in the underlying asset if the option expires unexercised.

Call Sale: Investors who sell uncovered call options have exposure on the upside that is theoretically unlimited.

Call Overwrite or Buywrite: Investors who sell call options against a long position in the underlying asset give up any appreciation in the underlying asset’s price above the strike price of the call option, and they remain exposed to the downside of the underlying asset in the return for the receipt of the option premium.

Booster : In a sell-off, the maximum realized downside potential of a double-up booster is the net premium paid. In a rally, option losses are potentially unlimited as the investor is net short a call. When overlaid onto a long position in the underlying asset, upside losses are capped (as for a covered call), but downside losses are not.

Collar: Locks in the amount that can be realized at maturity to a range defined by the put and call strike. If the collar is not costless, investors risk losing 100% of the premium paid. Since investors are selling a call option, they give up any price appreciation in the underlying asset above the strike price of the call option.

Call Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset’s price is below the strike price of the call option.

Put Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset’s price is above the strike price of the put option.

Straddle or Strangle: The seller of a straddle or strangle is exposed to increases in the underlying asset’s price above the call strike and declines in the underlying asset’s price below the put strike. Since exposure on the upside is theoretically unlimited, investors who also own the underlying asset would have limited losses should the underlying asset rally. Covered writers are exposed to declines in the underlying asset position as well as any additional exposure should the underlying asset decline below the strike price of the put option. Having sold a covered call option, the investor gives up all appreciation in the underlying asset above the strike price of the call option.

Put Spread: The buyer of a put spread risks losing 100% of the premium paid. The buyer of higher-ratio put spread has unlimited downside below the lower strike (down to zero), dependent on the number of lower-struck puts sold. The maximum gain is limited to the spread between the two put strikes, when the underlying is at the lower strike. Investors who own the underlying asset will have downside protection between the higher-strike put and the lower-strike put. However, should the underlying asset’s price fall below the strike price of the lower-strike put, investors regain exposure to the underlying asset, and this exposure is multiplied by the number of puts sold.

Call Spread: The buyer risks losing 100% of the premium paid. The gain is limited to the spread between the two strike prices. The seller of a call spread risks losing an amount equal to the spread between the two call strikes less the net premium received. By selling a covered call spread, the investor remains exposed to the downside of the underlying asset and gives up the spread between the two call strikes should the underlying asset rally.

Butterfly Spread: A butterfly spread consists of two spreads established simultaneously – one a bull spread and the other a bear spread. The resulting position is neutral, that is, the investor will profit if the underlying is stable. Butterfly spreads are established at a net debit. The maximum profit will occur at the middle strike price; the maximum loss is the net debit.

Pricing Is Illustrative Only: Prices quoted in the above trade ideas are our estimate of current market levels, and are not indicative trading levels.

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